

REMARKS

In the outstanding office action referenced above, the examiner has repeated a drawing objection to Figures 2a and 2c on the basis that steps 10 and 12 in Figure 2a and steps 18 and 20 of Figure 2c are not legible. Accordingly, Applicant proposes to amend these two drawings to make the respective steps legible. Applicant has attached hereto proposed drawing corrections made in red ink and respectfully requests the examiner to enter them and to withdraw the drawing objections.

The examiner has made two objections to the specification. Particularly, he has pointed out that the phrase "N times" on line 6 of page 3 of the substitute specification should be changed to "M times." Applicant has amended the specification to accord with the examiner's suggestion. In addition, the examiner points out that the phrase " G_{N+1} " on line 13 of page 5 should be changed to " G_{N-1} ." Again, Applicant has made the amendment in accord with the examiner's suggestion and respectfully requests the examiner to withdraw both drawing objections.

The outstanding office action also contains some claim objections. Specifically, the examiner objects to claim 1 on the basis that the phrase "N times" in step g) should apparently be "M times." Once again, Applicant has amended the claim to reflect the examiner's suggestion. Also, with regard to claim 6, Applicant has amended the claim at two points. In particular, Applicant has deleted the phrase "M+1 times" and changed it to read "M times." Applicant has also deleted the phrase "values M to 0" and replaced it with "values M to 1." Once again, these changes simply reflect the examiner's suggestions, and Applicant submits that the amendments overcome these two claim objections.

With regard to claim 1, the examiner has pointed out that the term “random” should be changed “to reflect that the faults are selected based upon an equation/probability.” He amplifies this point by further stating that “Further the idea of randomness is more of an abstract idea/concept that can never be fully achieved (hence pseudo randomness).” To overcome this objection, Applicant has deleted the word “random” from step c) of claim 1 and substituted therefor the phrase “pseudo-random.” Applicant submits that this amendment is sufficient to overcome the objection to the claim and respectfully requests the examiner to withdraw it.

The examiner has rejected all of the claims as obvious under 35 U.S.C. §103(a) over the combination of the Pomeranz et al. article (“On Static Compaction of Test Sequences for Synchronous Sequential Circuits”) (1996) and the Smith et al. article (“System Dependability Evaluation via a Fault List Generation Algorithm”) (1996). The examiner enumerates the ways in which Pomeranz “substantially teaches” various of the elements of claim 1, but specifically acknowledges that “Pomeranz does not teach of selecting the faults at random from the original fault list. Nonetheless, Pomeranz does teach of static compaction of the test sets so as to have shorter test application times and smaller memory requirements, see Abstract of column 1 on page 215.”

The examiner further cites the Smith article, allegedly in an analogous art, for teaching of “randomly selecting faults from an initial fault list, see Introduction in columns 1 and 2 of page 974.” While the examiner specifically acknowledges that Smith does not explicitly teach “using the randomly selected faults to simulate test vectors against, Smith does indeed teach of using the randomly selected faults to see if ‘the system properly handles faults.’” The examiner interprets this to mean “that if the system were to handle the fault properly, the fault would be detected/detectable by a test vector from a test vector set.”

Accordingly, he believes it would have been obvious to one of skill in the art to modify Pomeranz's static compaction method to include the random fault selecting teachings of Smith. He finds this modification obvious at the time the invention was made "because one of ordinary skill in the art would have been motivated by the suggestion provided by Smith that selecting faults at random from the total fault space of the system is a typical method used in a fault generation (and fault injection), see column 2, paragraph 1 under Background Theory on page 974."

The examiner further explains that having been thus motivated, the artisan "would then easily be able to repeatedly simulate Pomeranz's test vector set (minus redundant/duplicate vectors) against Smith's randomly selected fault list." He also finds that it would be obvious to the artisan "to limit the number of repeated fault simulations." The motivation for this step would be because "the purpose of compaction is to shorten test application times," so that the artisan "would want to cap (or limit) the number of times this process is repeated so as to not cause the compaction time to be too long, thereby wasting the time saved from the compacted vector set."

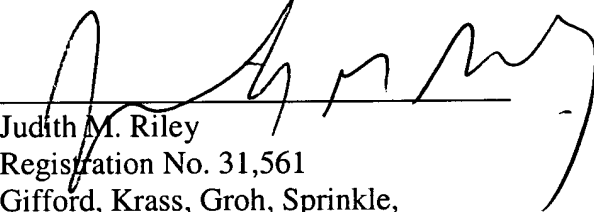
Applicant takes strong exception to the examiner's conclusion of obviousness and respectfully points out that neither of the additional prior art documents disclose, teach or suggest a system or method having all of the features of claim 1 (and the claims dependent thereon) as presently on file. In particular, neither of the documents suggests the concept of combining the use of randomly selected faults to measure the effectiveness of a test vector together with the idea of re-ordering a number of such test vectors, and then using an iterative process with faults being randomly selected on a changing probability for each iteration.

The Pomeranz article does not make use of randomly selected or pseudo-randomly selected fault lists. This greatly reduces the computational cost of the re-ordering process. In addition, Pomeranz deals with an approach for synchronous sequential circuits, in which a sequence of vectors is required to detect each individual fault. In contrast, the present invention uses randomly (pseudo-randomly) selected faults and single vectors to detect each individual fault. Accordingly, and as the examiner appears to recognize, all of the claims are certainly not anticipated over the teachings of Pomeranz. However, the examiner suggests that Pomeranz's teaching could be modified by teachings from the Smith article. However, Applicant submits that nothing in either reference or in the prior art of record would motivate the skilled artisan to make such a modification.

The Smith article actually describes a method for using random patterns to determine the reliability of a system in the presence of faults. There is, however, no disclosure of using sets of faults to re-order a number of test vectors. Therefore, although Applicant acknowledges that randomly selected patterns are used in Smith's method, there is nothing in the article which would motivate a skilled person to combine its teachings with the teachings of Pomeranz. Applicant respectfully suggests that the only reason anyone would think of combining the teachings from these two references would be if someone had the benefit of the hindsight teachings of Applicant's own invention. As the examiner is aware, however, hindsight reconstruction is not a proper basis for making an obviousness rejection. Accordingly, the present claims are not obvious over this particular combination of references, nor in view of any of the other prior art of record. Accordingly, Applicant submits that the claims as amended are patentable and in condition for immediate allowance.

Applicant respectfully requests prompt issuance of a notice of allowance of the pending claims. However, should the examiner have any additional questions or comments concerning the clarity or suitability of the claim language as amended, Applicant's attorney welcomes him to call the office number below for further discussion.

Respectfully submitted,



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Enclosures

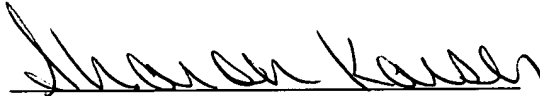
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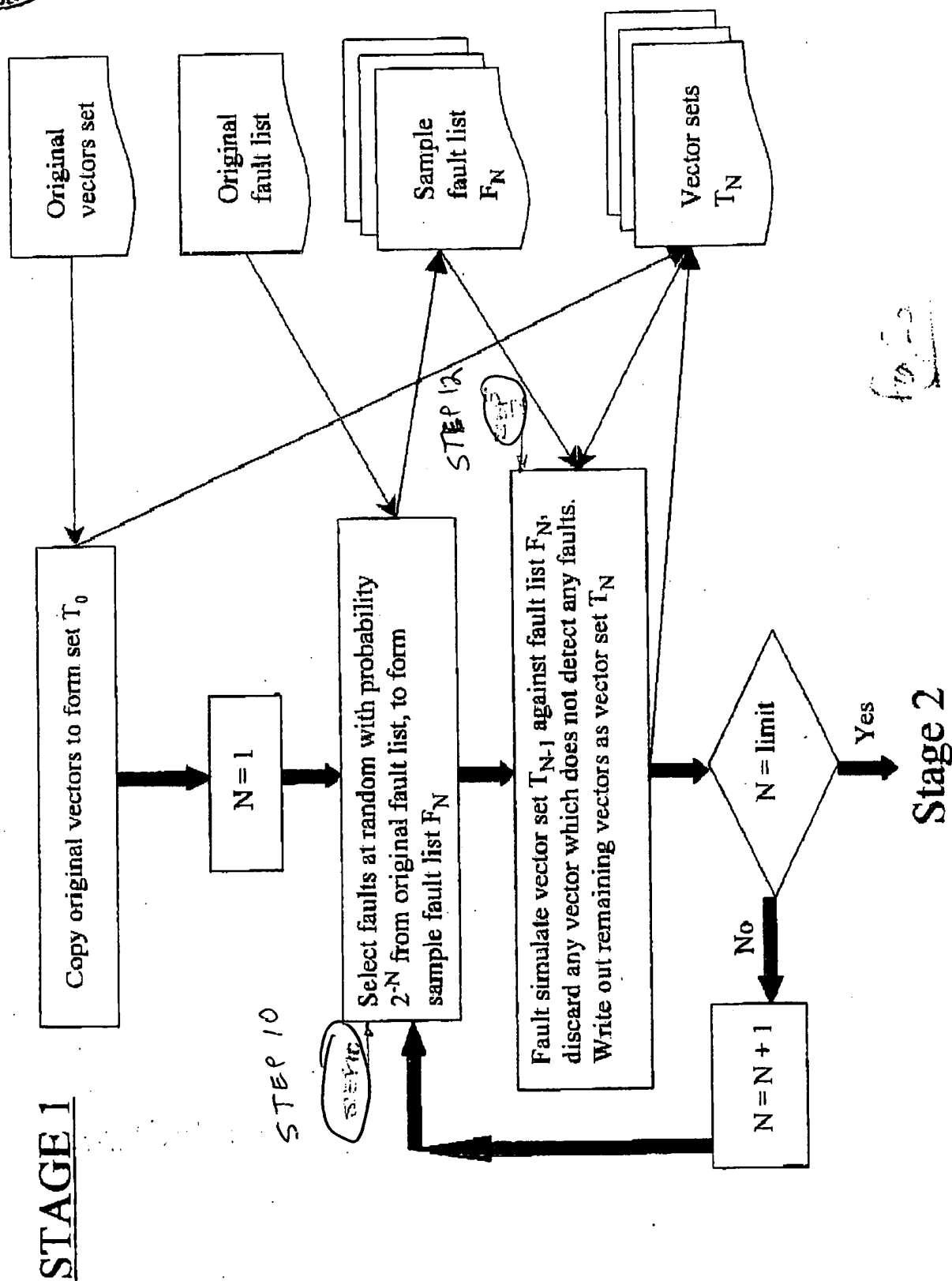
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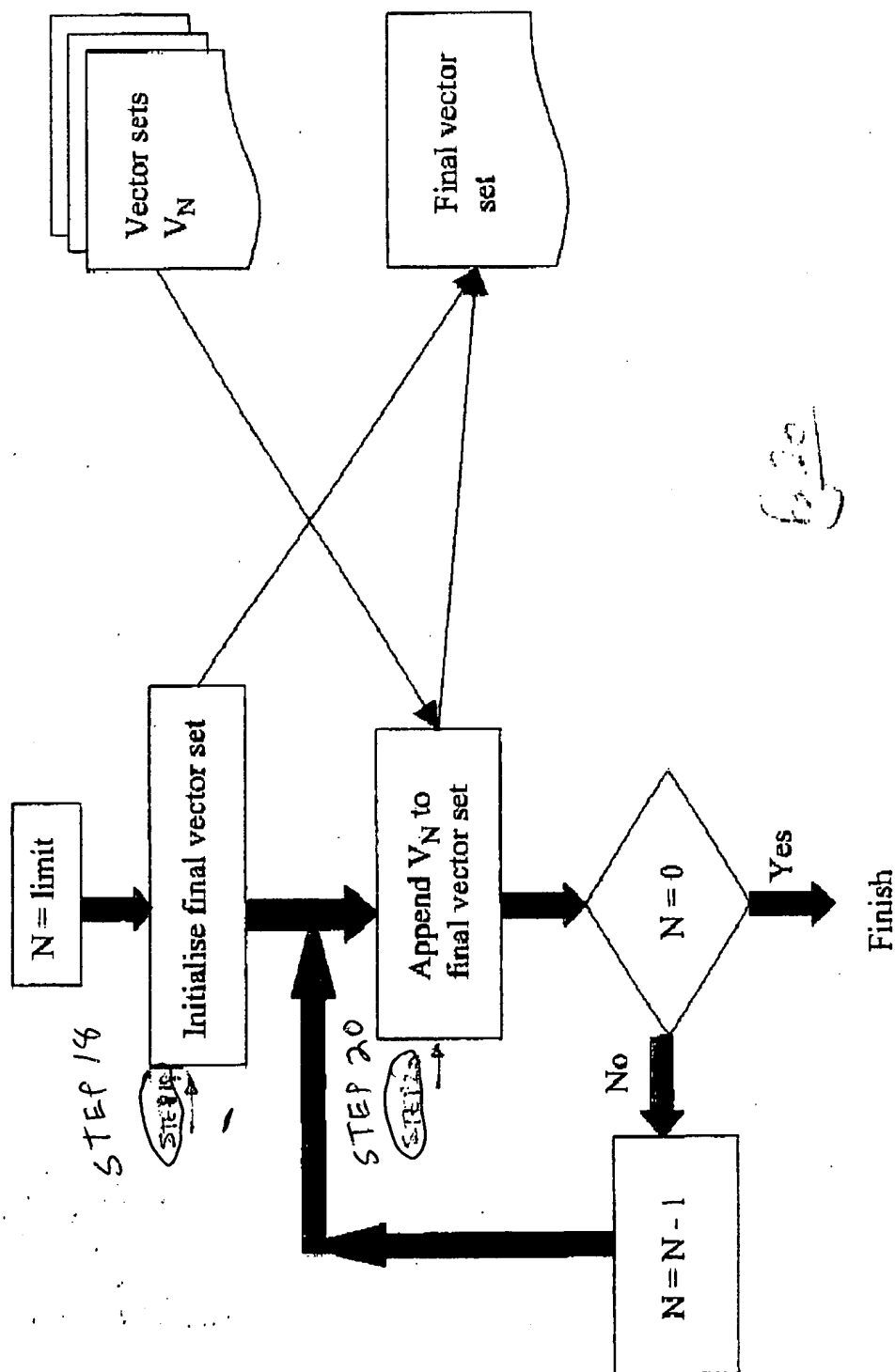


Fig 2:

STAGE 3